

# Earth Science

Rockhounds' NATIONAL Magazine



"Sea Lilies"—RHODOCRINUS see page 54

35¢

April Issue, 1959

## "Oriental Gold"

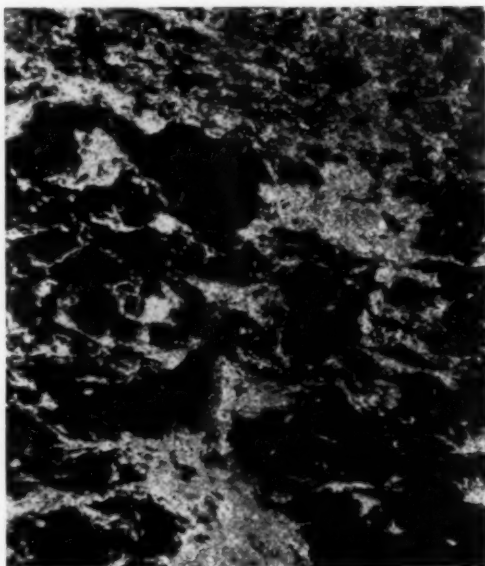
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# Earth Science

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## CONTENTS, APRIL ISSUE, 1959

EDITOR'S MEMO PAD		52
The Matter of Culture—Convention Dates, Paleontology and Our Cover Photo		
MIDWEST MINERAL CLUB NEWS	By Mrs. Bernice Rexin	55
Catch up on Midwest doings.		
RHODONITE	By J. Daniel Willems	57
A gem mineral with a beautiful blush. Complete directions for polishing.		
COLLECTING AND EXHIBITING CRYSTALS	By Helen Yeager	60
As is true with other rockhounds, we did not begin as crystal collectors.		
BRUNEAU CANYON JASPER	By Carl R. Kaye	63
The colors and patterns of this fine material vary from chocolate to reddish brown.		
FOSSILS IN INDIANA	By Dr. T. G. Perry	64
Fossils enable us to visualize animals which have been extinct millions of years.		
INDEX TO ADVERTISERS		72

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## Editor's Memo Pad

THE MATTER OF CULTURE! *What is culture?* Just where do rockhounds fit into the picture? This *is* a big question, which indeed may be viewed from many angles. Truly, it appears to some, perhaps even to many, that the great classical culture of the past, in all its glory, is rapidly reaching the vanishing point in these United States.

Looking at the entire matter from a very realistic viewpoint, one might reasonably conclude that genuine classical culture is in fact being rapidly replaced by the dollar culture. The place of great literature is being usurped by salacious piffle; great music, by tinkling jazz; great art, by hideous modernism; great sculpture, by ornate monstrosities; great architecture, by straight line; and lectures, by murder-movie\* TV programs. Is it really as bad as all this,—perhaps not, but when we seriously pause and consider the matter, just what does the future hold for us in so far as genuine culture goes.

In our modern world, instead of admiring and loving the splendid classical culture of the past, we may prefer or be more apt to be thinking in such terms as agriculture, horticulture, bee-culture, germ culture, and on the brighter side of the picture, gem-culture, and pearl-culture, much more esthetic though perhaps not of as much importance.

Gemology, the culture associated with gems, the jewelry craft, etc., is as old as civilization itself. One need only look to the Bible, or our great archeological discoveries of recent times to be convinced of this fact, and perhaps at no time in history has more attention been given to the gem craft, both professionally and by laymen (rockhounds) than at the present. So, here definitely is one form of culture that is not in retrograde, and we are happy to say that no one single factor can be given more credit for this fact, than the beneficial influence of the amateur lapidary, and for that matter the entire mineral club hobby as a whole.

Culture, then may be defined in many ways—particularly as the enlightenment and refining of one's taste by intellectual or aesthetic training—and in what better and more enjoyable way, we ask, may this be accomplished than by joining and taking an active part in an Earth Science club where one may be encouraged to study, learn more about, and actually work with those many most beautiful, God-made objects which we are all privileged to collect, own, admire and by so doing become more or

less familiar with, as we would with old friends. This really is one form of culture that no one can take from us, and which will certainly fortify one against the monotony of retirement and old age which so sorely afflicts many people. Pursue and follow your hobby as far as you can go and it will pay off big in your future.

---

### Geochemical Prospecting For Metals

A talk by Dr. William F. Jenks

CINCINNATI MINERAL SOCIETY was fortunate in having as its guest speaker on November 26, Dr. William F. Jenks, Head of the Department of Geology and Geography, University of Cincinnati. Dr. Jenks spoke on "Geochemical Prospecting." This is a relatively new technique now being used commercially to locate hidden bodies of lead, zinc, copper and other base metal ores.

Briefly geochemical prospecting locates ores by spectographic and chemical analysis of the halo and aura of the suspected deposit. The traces of metals present in the halo or aura were extracted from the ore body by ground water which flowed upwards or laterally to areas beyond the sought-for mineral deposit. These trace analyses are reported in parts per million and are compared with background analysis for the same metals in soil, strata, etc. in an area where no ore body exists. If analysis of the halo and aura indicate 150 to 200% more metal content than exists in the background material, an ore deposit is strongly suspected.

A second technique concerns the analysis for desired base metals in roots, stems, trunks, limbs and leaves of plants and trees in the aura and halo area and comparing the results with similar analysis of vegetation in areas where no appreciable amounts of base metals are present.

Dr. Jenks, who is well qualified to discuss geochemical prospecting because of his personal experience in various parts of the country, made an excellent presentation of this interesting subject.

CMS reports that it recently made several trips to quarries in Indiana and obtained some splendid specimens of calcite, fluorite, celestite, sphalerite and geodes. One trip to the Flint Ridge area in Ohio produced striking specimens of banded flint which polishes beautifully.

---

(\*murder-a-minute).

## 1959 CONVENTION DATES

*Get these dates on your calendar.*

ONE OF THE SERVICES undertaken by the American Federation is the coordination of Regional Convention dates so that they do not stack up on each other and thereby interfere greatly with the common welfare of all concerned. Hazen T. Perry, president of the "American" has appointed Helen M. Rice to serve as Convention Coordinator, who takes pleasure in announcing the following dates and locations of the several Regional Conventions at this time:

\*The '59 American Federation Convention will be held in the Civic Auditorium, 1520 S.W. 3rd Avenue, Portland, Oregon with the

Rocky Mountain Federation  
Texas Federation  
Midwest Federation  
California Federation  
Eastern Federation  
Northwest Federation

April 24-26  
May 1-3  
June 18-21  
June 26-28  
July 16-19  
Sept. 5-7

Wichita, Kansas  
McAllen, Texas  
Springfield, Ohio  
San Mateo, Calif.  
Boston, Mass.  
Portland, Oregon\*

Northwest Federation serving as hosts. Mrs. Rice, Convention Manager advises that committees have already been appointed and are working on plans for many special displays, programs, field trips and a good banquet for the entertainment of visitors coming from all parts of the country.

Watch for full details concerning the Midwest and Eastern Federation Conventions in our June issue which you will receive on May 15th, and see the account of arrangements for the Rocky Mountain Convention at Wichita, Kansas in this issue.

## 1959 MIDWEST FEDERATION CONVENTION

**IMPORTANT ANNOUNCEMENT:** — The Nineteenth Annual Convention of the Midwest Federation of Mineralogical and Geological Societies which is to be held in Springfield, Ohio, at the Clark County Fairgrounds on June 18 through 21st, 1959 is shaping up very well, writes Mr. Fred Rentzel, General Chairman of the Convention, whose address is 687 Beechwood Avenue, Columbus, Ohio. The Fairgrounds are on State route 70 which is just a short way from U.S. 40, where one may find plenty of motels and restaurants.

The Miami Valley Mineral and Gem Club are to be the official host for the Convention, and they are being very ably assisted by other Societies located in neighboring cities. They were indeed fortunate in being able to secure the use of the Fairgrounds for housing the Convention as the buildings are new and modern.

There will be adequate rest areas provided, something which is often missed at a large Convention. "We are planning benches in strategic spots, backed by greenery and flowers to make it more restful. The food will be served at a snack bar with plenty of tables at which to eat. The grounds are smooth and there will never be a traffic problem." "If you have a travel trailer, bring it, as we have trailer space at the fairgrounds. For Motel and Hotel reservations, we suggest that you consult your AAA book and make your own EARLY."

Many outstanding speakers will appear on the program, including Mr. Edwin Goff Cooke of Chicago whose topic will be Southwestern Archeology; Mr. Gus Brown of Des Moines, Iowa, inventor of the V-Lock, who will speak on "Unlimited Original Design"; Mr. Adolf Rahm, of Fairborn will tell of his experiences in the Oriental gem markets; Mrs. Lester Cunningham of Chicago, on Lake Superior Agates; Mrs. Harold St. John, on "Gems of the Bible"; and Dr. Ida B. Carmichael of Cincinnati will tell of her studies in the Gem Centers of Europe.

Aside from the above, there will be almost continuous working demonstrations of the lapidary work. There will be a large number of fine dealers with everything to sell that you might need for your hobby. We have 45,000 square feet of space and it looks at though it will be well filled. There will be some outstanding special exhibits among which will be some stone necklaces from the Smithsonian. The Midwest clubs are all invited to send a display to be entered in competition with each other.

The usual Convention and Post-convention field trips are now being planned and further information concerning their details will be forthcoming in the June issue of EARTH SCIENCE.

**BEGIN MAKING YOUR PLANS AT ONCE TO ATTEND THIS GREAT SHOW.**

## ROCKY MOUNTAIN FEDERATION CONVENTION

### *Plan to Attend the Wichita Convention*

FRIENDLY hospitality to visiting rockhounds will be the keynote of the ROCKHOUND RENDEZVOUS, name chosen for the joint

convention and show of the Rocky Mountain Federation of Mineralogical Societies and the Wichita Gem and Mineral Society. The Kansas National Guard Armory, Wichita, Kansas, will

be the scene of the three-day event—April 24, 25, and 26, 1959. There will be free parking just outside the Armory and free camping grounds for visitors are being provided at the west edge of Wichita.

Business meetings of Federation groups will be interspersed with a program of lectures and field trips. In addition to the Federation competition, there will be numerous non-competitive and special exhibits. Working lapidary, radioactivity, and fluorescent displays are planned. Selected dealers also will be on hand.

Among the outstanding lecturers that have been obtained will be Mary Frances Berkholz, field trip editor of *Gems and Minerals* magazine, who will speak on the topic, "The Field Trip Program." Dr. Robert Berg, head of the geology department of the University of Wichita, will speak on the "Geology of the Tri-State Mining District." A micromount symposium will be conducted by Arthur L. Flagg, curator of the state mineral museum, Phoenix, Arizona, and Dr. Kenneth E. Rose, of the University of Kansas, will lecture on the subject "Crystal Gazing," which accompanies the projection on a screen by Rayoscope of the actual growth of microscopic crystals of

minerals and chemical compounds.

Among many special exhibits will be the famed dinner set fashioned from Death Valley onyx, belonging to Walt Pilkington of Hesperia, California; the Anthony and Mary Frances Berkholtz collection of precious opal; rare Crestmore and Magnet Cove minerals, shown by Elmer Banion of Topeka, Kansas; a collection of 19 art objects carved from semi-precious stones in China and Japan, displayed by Mrs. Frank Ulrey, Topeka, and faceted gems from all over the world, shown by Brace Helfrich, Wichita.

Post-convention field trips are also planned. Monday morning at 9:00 o'clock a trip will leave the armory lot to visit fossil and geode locations in central Kansas. This trip will end at Ottawa. On Tuesday morning, beginning at 8:00 o'clock, the group will be guests of Dr. A. C. Carpenter, Ottawa, at his home at 304 East Eleventh. They will visit his home museum and later go to several locations, where fine plant fossils may be collected. These include fern and calamite stems and leaves. Other trips may be announced later.

N.B. For further particulars write Mrs. Walter J. Broderson, 657 McLean Blvd., N.W. Wichita, Kansas.

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**NEW MEMBERSHIP CARD:**—A recent addition to the many services which the Midwest Federation renders its affiliated Societies is a new individual membership card which is designed to serve a dual purpose. One side of the card will show that you are a member of your local society, and the other that by your affiliation you are a member of the Midwest Federation and also the American Federation which should be of considerable value to you if you wish to travel widely.

This new style card will also serve as a great convenience to many of our new Societies while they are in the process of organization and do not yet have their own supply of cards printed. Some Clubs may even desire to use these cards permanently. Supplies of the cards may be had free upon request, by writing to Mr. Orval Fether, Federation Treasurer, whose address is 818 Birch Street, Downers Grove, Illinois.

\* \* \* \*

**PUTTING MICROBES TO WORK:** Pioneering work in microbial research has begun at the Bureau of Mines to determine usefulness of microbes in recovering copper, nickel, cobalt and other metals from low-grade shale, and for studying the structure of coal. Tests conducted have shown that bacterial action oxidizing sulfur to acid, results in recovery of many more times more metal from low-grade ores.

**PALEONTOLOGY:** *The study of fossils*,—is one branch of Earth Science which is becoming increasingly popular. It is now seldom that we see a collection of minerals that does not contain at least a few fossil specimens scattered through it, aside from the petrified woods which are always omnipresent.

We were indeed fortunate to be able to present in our last issue (Feb., '59) a splendid article on vertebrate paleontology from the versatile pen of June Culp Zietner. We are now following this up by another splendid article, this time on invertebrate fossils by Dr. T. G. Perry, of the Indiana Geological Survey, having in mind that many of our Midwest rockhounds going to the Springfield, Ohio, convention next June will be crossing the state of Indiana, and may have the opportunity to do some collecting on their way. Luck to you.

\* \* \* \*

**OUR COVER PHOTO:**—"Rhadocrinus"—by Katherine H. Jensen was entered in the Chicago Natural Photography Exhibition, where it received honorable mention. Crinoids belong to a genera of the great family (phylum) Echinodermata, and as a species which has been extinct for many millions of years, these fossils are of unusual interest to collectors. For more details see Dr. T. G. Perry's article on the "Fossils of Indiana" in this issue.

## Midwest Club News

Mrs. Bernice Rexin, Club Editor

3934 N. Sherman Blvd.,  
Milwaukee 16, Wis.

**EARTH SCIENCE CLUB OF NORTHERN ILLINOIS** on Jan. 9 heard Elmer E. Rexin, Seismologist, discuss earthquakes in general and in particular his well-seismograph which is located in the basement of the Nunn-Bush Shoe Co. The distance of an earthquake from a recording station, Mr. Rexin said, is determined by a computation involving the time lapse between the primary and secondary waves of the quake and the speed at which such waves travel through the earth. The epicenter of a quake is located by triangulating the distances of a quake from three or more separate recording stations.

The library of **ESCONI**, which has grown to 234 books and pamphlets, has been placed in the Downers Grove Library and will be loaned to the public under the established rules of the library. All of the books have been stamped with the **ESCONI** seal and will remain the property of the club. A complete list of the books is being prepared and each member of the club will receive a copy.

**HEART OF AMERICA GEOLOGY CLUB** reports that one of its members, Earl Richy, recently visited Homer E. Miller who showed him some very interesting material collected in Utah that he had identified as petrified dinosaur meat. A complete hookworm is revealed in one slice of the petrified white meat when it is magnified 500 times. A slab of the petrified red (muscle) meat contains several trichinae in a corkscrew-like posture. The trichinae can be seen in three dimensions and without magnification.

**MIAMI VALLEY MINERAL AND GEM CLUB** members have donated some fine mineral and fossils specimens for a permanent display in the Fairborn, Ohio school. The specimens will also be used for study purposes.

**MEMPHIS ARCHEOLOGICAL AND GEOLOGICAL SOCIETY** at its January meeting visited our newest state, Alaska, via a colored movie. The film included pictures of icebergs, ice falls, glaciers and some of our military installations.

**SHAWNEE MISSION GEM AND MINERAL SOCIETY** recently held its first show. The show, which was thought up and promoted in just a few days, was a remarkable success. Exhibits featured fossils, minerals and gems. Those in the junior divisions were competitive and the first prize ribbon was won by Dicky and Larry Johnson. Adult exhibits were non-competitive.

**ISHPEMING ROCK AND MINERAL CLUB** was recently shown a colored slide travelogue of the Northern and Western part of the United States. The pictures were shown and commented on by Eric Rex, geologist for the Cleveland Cliff Iron Mining Company.

**KALAMAZOO GEOLOGICAL AND MINERAL SOCIETY** on January 5 viewed a film on the cutting and polishing of agates, which was prepared and shown by Hugh Jameson of Jackson, Michigan. Mr. Jameson introduced his film with a short talk on "Agate Hunting." Following the showing of the film, member Wayne York told the group about his visit to Franklin, N.J., and exhibited specimens of franklinite and other fluorescent materials that he and Mrs. York collected while on the trip.

**CINCINNATI MINERAL SOCIETY** held its annual Christmas party on Dec. 12. After dinner, past-president Dr. A. K. Presnell discussed the correct time of the birth of Christ based on biblical and historical facts, which indicate that it occurred about 5 B.C. He then outlined the possible astronomical explanations for the Star of Bethlehem.

**CENTRAL MICHIGAN LAPIDARY SOCIETY** recently heard John Mihelcic, Mineralogy Division Chairman of the Midwest Federation, speak on "Mineralogy." Mr. Mihelcic illustrated his talk with beautiful kodachrome slides of his famous collection. John and Lillian Mihelcic plan to move to Oregon next year. They are well-loved in the Midwest and their many friends are sorry they are leaving Detroit, but wish them happiness in their new home.

**CENTRAL ILLINOIS ROCKHOUNDS** will hold its annual exhibit in the Decatur YMCA, March 21-22. Visitors are welcome. The group is considering holding a second show in the fall and invites other Midwest clubs to hold a joint meeting with it at this time. At this meeting it plans to have speakers, exhibits, and prizes, and to sell rocks, minerals and jewelry to the public. Clubs that are interested in cooperating with CIR on the fall show should contact President George M. Davis, Box 201, Blue Mound, Illinois.

**MICHIGAN MINERALOGICAL SOCIETY** at its January meeting heard Dr. Chester Slawson of the Mineralogical Laboratory, University of Michigan, speak about his most recent trip to Africa, particularly about diamond mining in Sierra Leone, Ghana and the Belgian Congo. His talk was well illustrated with kodachrome slides. Dr. Slawson gave active aid to MMS in its early years and was particularly prominent with Dr. Colburn in establishing the Cranbrook Institute's mineral collection.

*(Continued on page 68)*

*A modern introduction to general paleontology  
including material on plants, invertebrates and vertebrates*

## **TIME, LIFE and MAN**

### **The Fossil Record**

By RUBEN ARTHUR STIRTON, *University of California, Berkeley*

**Offers an authoritative survey of the entire field . . .**

This book provides a comprehensive treatment of paleontology, outlining methods and principles. It includes a condensed classification of plants and animals; a discussion of the sequence of life and environment; and special sections on selected subjects, such as, dinosaurs, horses, ammonites, birds, and man. The author emphasizes: identification, form and function, associations of plants and animals, evolution in the different groups of organisms, and dispersal and distribution of plants and animals through time and space. The core of the book deals with a chronologic presentation of the sequence of life from the Precambrian Era to the Pleistocene Era. In many respects this section of the book is much like historical geology, but the fossil record is emphasized more than the physical events in the earth's history.

**Special features . . .**

- The author discusses the methods of locating, collecting, and curating specimens, as well as preparing them for study
- Scientific and common names, in their various usage for fossils, are utilized to acquaint the student with terms he may encounter in outside or assigned reading
- Throughout the book attention is directed to individuals who have contributed to our terminology, to our knowledge of fossils, and to the study of the sequence of life
- The book contains numerous, carefully delineated, illustrations

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**1959**

**558 Pages**

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## RHODONITE: The Gemstone with a Blush

By J. DANIEL WILLEMS

RHODONITE is red, rose-red. It has a rare color among the gems. A color which is a shade of red or pink distinctive in quality. It is not a bold color, like the crimson of warm blood, As a surgeon I am well accustomed to the bright, lively spurt of fresh arterial blood in an open wound. It makes a very pretty sight, even though alarming and gory. Crimson is the most positive attention-getter in the entire spectrum. One cannot, somehow, think of blood as of any other color than crimson. It means danger.

Things are not quite the same with rose as a color. Rose also has character, however, rose is not a "hot" color. Nor is it exactly "cool." Its effect is not exciting, but rather warming and eminently pleasing. Rose has just the faintest remembrance of bluish purple in it—a blush.

Rhodonite of good gem quality is rose red, one of the most gratifying of all colors in gemstones. In any piece of rough material this color may not remain uniform throughout, but fade imperceptibly into a lighter pink, or into an orange pink. Even a suggestion of green or brown or yellow may be encountered. Rhodonite from certain localities is flesh pink. In any slab several of these shading can occur. But the over-all color impression of rhodonite remains largely rose red.

How well I know that color connoisseurs who have reached this paragraph will take issue with me. No two people will see exactly the same shade in color.

Some individuals even have a decided difference of color perception in their two eyes. So my stand at this point is simply this: I have stated what I personally see in rhodonite, but cannot speak further for what others may see.

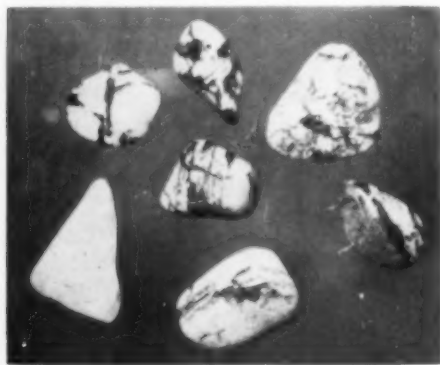
The word rhodonite is derived from the Greek "rhodon," which means, "the rose." It is an attractive name and serves an attractive stone, which is as it should be. It is descriptive and distinctive and completely fitting.

Rhodonite is a silicate of Magnesium (Mangankiesel in German) with the formula  $MnSiO_3$ . The chemical composition, when "pure," is silica 45.9%, Man-



Rhodonite Slabs. Upper and lower left, from California; lower right from Australia.

ganese 54.1%. Traces of calcium and iron may be present. The mineral occurs in nodules, boulders, or masses which in some localities are quite large. Thus it is suitable for carving out various large objects, such as table tops, mantels, etc. It has unique markings of black due to the manganese present, which has changed by oxidization to the black manganese oxide. While the red areas in the stone may show a slightly translucent quality, the black regions are always opaque. When nicely distributed, these black markings form an infinite variety of completely haphazard reticulated designs and patterns which lend relief to the red areas, and by their interlacing irregular lines develop a uniqueness which differentiates rhodonite from every other stone. It is not likely that a typical piece of rhodonite will be confused with any other gem material. This is in spite of the fact that rhodonite has, in certain localities, been passed off as "rose colored jade," which is a completely false label. The two are totally different in every respect except for a slight resemblance in color.



Rhodonite Baroques. All from California, except the light one which is from Australia.

Rhodonite of fine close-grained quality was formerly mined in large quantities in the area of Ekaterinberg, Russia. During the days of the Czars a large lapidary industry developed there, which turned out many beautiful decorative objects,

some of which are still to be found in museums today. I have seen vases, cups, saucers, dishes, spheres, columns, altars, jewel boxes, and a few small animals of great beauty and exquisite workmanship. Of all these objects the ones that stand out in my mind are two table pieces which were made for the royal tables. They consisted of carved fruit, vegetables, flowers, melon slices, etc., all carved of different gem materials, including rhodonite, to represent the appropriate colors, and grouped upon a rectangular base of black onyx or in a dish of rhodonite. What a centerpiece for a royal table! Another favorite object of the Czars were clocks with housings carved from solid blocks of rhodonite.

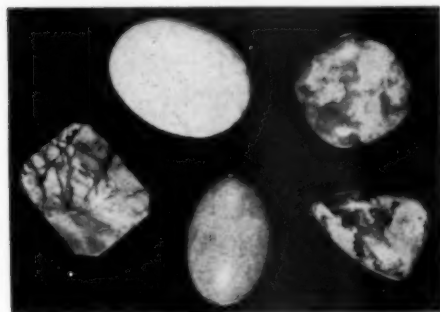
Let it not be understood though that rhodonite was considered a lesser gemstone. Beads, long strings of them, beautifully matched and graduated as to size, and skillfully arranged in artistic sequence of color shade and pattern were highly prized in the Russian court. Curiously, Peter Carl Faberge, the Russian court artist who produced the fabulous easter eggs for the royal family, seems to have preferred other materials to rhodonite. Of all the objects he carved I have been able to find only a very small number described in the literature.

Rhodonite as a gemstone is adaptable not only to beads, as mentioned above, but also to cabochons as well as special objects such as panels, plaques, pendants, trays, paper weights, and the so-called rhodonite today, it seems to me, is the bibelots. The fittest place, however, for tumbled baroque. Here, due to its variety of designs and color contrasts a resourceful mind with a bit of imagination can let itself go to any creative length in making most highly attractive objects of decoration. The material takes a beautiful polish in the tumbler, the shapes and sizes are infinite, and it is not difficult to work. The stone is quite tough—the only quality that it has in common with jade.

Besides forming gemstones in the tumbler, rhodonite will also cut into attractive

cabochons, especially where a fine, close-grained slab can be marked out into smaller areas of pleasing patterns. It works in very prettily with silver.

Rhodonite has a hardness varying from 5 to 6½, which is just barely hard enough for a gemstone. It has great toughness. Its specific gravity is 3.4 to 3.6, its refractive index 1.73. Its lustre is said to be vitreous to pearly. It is biaxial and optically negative. It crystallizes in the triclinic system, all angles and planes cutting each other at inclined angles.



Rhodonite Cabochons. From left to right, upper row: from Australia, from Massachusetts; lower row: from California, from Massachusetts, from California.

Rhodonite is not difficult to cut and shape. Some of the material is somewhat "grainy" which makes it difficult to polish. So far as I know no easy and sure method has been worked out which is specially adapted to polishing rhodonite. The usual polishing powders are used on felt wheels. Perhaps chrome oxide is a little more favorably regarded than the others.

Rhodonite occurs in many regions of the world. Russia produced abundant quantities of very fine material, principally for the Czars. Since the Reds have messed up the situation this source seems to have dried up, at least for the present. California has produced some fine, well-marked material, and is at present the most likely source in our country. Australia furnishes some rhodonite of light pink shades with markings which are more patchy than reticular. From Massachusetts comes a flesh colored material which takes a very high polish quite

easily and is fully equal to the Russian. Rhodonite has also been obtained in Maine, Vermont, New Hampshire, and in Rhode Island. Near Butte, Montana, a large source of gem quality material has been reportedly found in association with rhodochrosite. Near Franklin, N.J., crystals up to seven inches thick, forming in groups have been found. It is said that it also occurs in Spain, and in Sweden, where small gem quality translucent crystals are found, but are not being cut into gemstones there. The crystals have a thick tabular habit with perfect cleavages parallel to the prism faces.

Rhodonite is a gemstone that is relatively unfamiliar to the jewelry trade, but deserves more acceptance. It has the advantage of a distinctive color, one that can be compared with the blush of a peach, one that is not simulated by any other stone. It is well adapted to cabochons and especially so to baroques. It is not expensive, nor difficult to obtain, and it is very attractive in silver settings.

## Stones Mentioned in the Bible

And I will make thy windows of AGATE, and thy gates of CARBUNCLE, and all thy borders of pleasant stones. *Isaiah 54:12*

\* \* \* \*

And before the throne there was a sea of glass like unto CRYSTAL: and in the midst of the throne, and round about the throne, were four beasts full of eyes before and behind. *Revelation 4:6*

\* \* \* \*

The sin of Judah is written with a pen of iron, and with the point of a DIAMOND: it is graven upon the table of their heart, and upon the horns of your altars. *Jeremiah 17:1*

\* \* \* \*

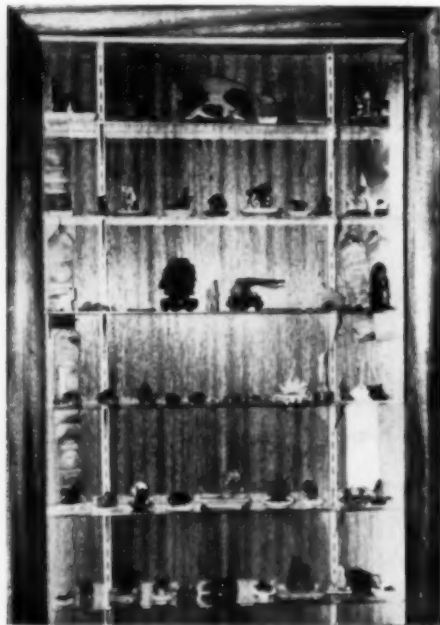
O thou afflicted, tossed with tempest, and not comforted, behold, I will lay thy stones and fair colors, and lay thy foundations with SAPPHIRE. *Isaiah 54:11*

# Collecting and Exhibiting Crystals

By HELEN YEAGER

AS is true with other rock hounds we did not begin as crystal collectors. When many of the old favored spots for hunting agates in Central Oregon closed to collectors, we changed to another type of rock collecting. Actually it was a very gradual change and almost before we realized it we were building a collection of crystals.

We bought our first crystal from Robert Roots seven or eight years ago. It was a very small Tiger Diopside and Cerrusite, a pretty little thing and very inexpensive. Shortly after that we attended one of the California Mineral Shows and there saw some of their fine collections. Then the bug bit! Thinking back it seems that, at that time, there were more dealers showing crystals in California than in our own state but it was not long before these same dealers were selling crystals in the Northwest.



**IDEAL CASE FOR DISPLAY OF CRYSTALS**  
A part of the Yeager crystal collection which will be shown at the National Gem Fair, Labor Day Week End, Portland, Oregon.

We must have been blessed with beginner's luck, when we started buying crystals, because we luckily purchased good ones. Not because we knew anything about them but because of the fashion we had decided to mount them. At first we placed the crystals in an upright position on small ceramic containers. For this reason we were very careful that the outer edges had good shaped crystals showing and that there was an interesting all-over shape to them. In fact, they had to be good looking on the top, front and sides, with the exception of the back.

After we had collected for some time we found that in being so choosy we had at the same time chosen good clean unbroken crystals with little gangue or matrix. We had to keep the weight of the crystals down in order to mount them upright. Quite naturally there was only a slight amount of matrix showing. And because we didn't like the edges of the crystals to be ragged and not knowing the true shape of most of the crystals, we again were lucky we didn't pick broken specimens.

Now when we buy we are more understanding of perfection and can identify it more readily. We are harder to please now. We still look for good shape on the edges of the crystals but now we watch for good color with no marring or breakage anywhere on the face of the crystals. We also guard against specimens which have been stained by other minerals unless we know it is a stain easy to remove.

Where does one get crystals? If you are lucky, you travel to the mines where they are mined, perhaps in Idaho, Arizona or Mexico. Any state where mining is an important industry. There, sometimes you can find miners with some pieces for sale. Or, you attend Mineral Shows where you can find dealers with a more complete line of merchandise. Some of the dealers have wonderful shops

where they can show you an unlimited supply, to make your selections from.

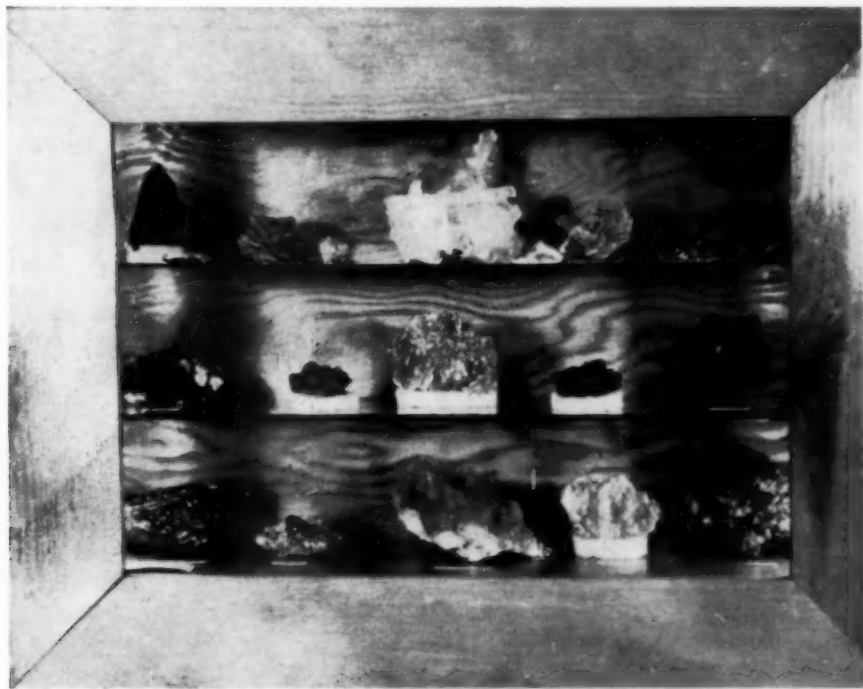
The later two ways of course are the most perfect. At the shows one can find many more kinds of material, because the dealers are constantly on the lookout for unusual specimens. Their contacts are much better than those of the individual collector. After one becomes acquainted with them they often are a big help in finding the more rare and scarce crystals.

We might inject a word of caution at this time. It is awfully hard not to buy every crystal you like at first. But if you are planning to exhibit your crystals there are limitations you must obey. Some collectors buy only for their personal pleasure, but others like ourselves buy them for a collection to be entered in competition. A show naturally must have competition rules and they have the crystals divided into sections according to size, etc. So if you collect, for instance, in the miniature class you buy crystals which are one and a half by two inches. If it is for a thumbnail collection the specimen must

fit into an inch square box, and be in good proportion to the box. If one lets his enthusiasm run away with him and buys crystals which are too large or too small he cannot use them in his exhibit. And it is always risky to try to break down a specimen to make it fit. There is a good chance of completely ruining it.

The way you mount or display the crystals must be a factor in their selection. The mount must be attractive and not detract from the specimen. We are now mounting ours on small blocks of clear plastic. We make our own mounts, because we didn't like the size of the commercially made ones. You need to be sure that the crystal has a face which will allow easy mounting. If the matrix is hard on the bottom side and very bumpy it does not give you a good surface to glue onto this type mount. If your case should be jostled in the show and the unsecure crystal falls, they are often broken and may break others.

We have found another factor in exhibiting most important. This is the light



Neat wall or table display case—William H. Allaway Collection

in the case. Because you are showing many fragile crystals, many with a high water content, you must be careful that you do not have too much heat. You want good adequate lighting that does not change the color of the crystals but not light that is so hot that it will bleach out the crystals by drying up all the water content in them. Of course a clear plastic can be applied and it helps some crystals. When a case is in a show for three or four days with lights on it gets quite hot in the case. So one carefully chooses as cool light as possible and provides adequate ventilation.

Then we come to the labeling. These labels should tell the name of the crystals, their locality, and the chemical composition of the crystal. Frankly it is much more fun to set up a case without worry about labels. But it really behooves us to make it easier for the public who come to see the shows. They of course don't know the names of the crystals.

We have found that it is most important to keep a record of each purchase so we inventory all our crystals and number them as they are bought. We have a permanent record and so there is really no excuse for any mistakes on our labels. All the information we need is on record.

These labels should be as small as possible to hold the information needed and yet in scale to the specimen exhibited. Spelling should be watched. The color of the label sometimes can add a lot to the display, just as a poor choice can detract from it.

This sounds as if one is bound by many conditions. But it really adds a challenge to showing your things, and in no way detracts from the enjoyment of collecting. This is a hobby that can fit any pocket or any home. If you have little storage room and can only show a small collection at home either of these two collections are wonderful. They too, can fit any pocket book, just exercise a little common sense.

As for the personal pleasure one derives from the hobby we have found it a re-

warding one. We have had to learn much about crystals and are still learning. Education is always good for one. We have gained many new friends across the country who share our love for the hobby. But most of all, the joy of sharing these beautiful bits of nature's handiwork is unending, especially when you show your collection to someone who, up to that moment, has never seen a beautiful crystal at close range. Their wonder and disbelief that these lovely things literally just grew, not man made, but another marvel provided by Mother Earth.

\* \* \* \*

### Book Reviews

THE GEOLOGY OF URANIUM by V. S. Karpenko, V. L. Shashkin, et al. Translated from Russian. Supplement No. 6 of the Soviet Journal of Atomic Energy. 128 pp. \$6.00. Consultants Bureau, Inc., New York, 1958.

This book is a collection of twelve papers on various phases of uranium and its compounds. It should be of interest to specialists who are concerned with the search for and study of uranium deposits, also to geologists who have studied other mineral deposits in which uranium has occurred. It is not, however, recommended for the amateur mineralogist or geologist.

Titles include Metamorphism of Uranium Ores, The Origin of Uranium Mineralization in Coal, and Hydrothermal Synthesis of Uraninite. Other papers discuss the origin of uranium deposits, especially those formed contemporaneously with sedimentary rocks. A comprehensive survey of aerial geophysical methods and their application in a number of countries are also included. Methods are described in detail for radiometric study of uranium and this paper is illustrated with many actual radiograph exposure photographs. Several new minerals are discussed such as nenadkevite and ursilite.

E.D.C.

\* \* \* \*

THE FOSSIL BOOK by Carroll Lane Fenton and Mildred Adams Fenton. Doubleday and Company, Inc., 482 pp., 1958. \$12.50.

This book is a survey of prehistoric plant and animal excepting man. It is the most comprehensive popular volume that this reviewer has seen. The changing world is emphasized, not only changes due to successive geologic ages and the progress of life, but also some of the variations in form from immature to adult.

(Continued on page 69)

# Bruneau Canyon Jasper

by CARL R. KAYE, Nampa, Idaho

ROCK enthusiasts and gem-cutters the world over are continually looking for new material with which to work, as well as for that rare specimen that can be worked into a cabinet piece. Bruneau Canyon Jasper, because of its pleasing color and unusual pattern is highly prized as specimen material. Very outstanding cabachons can also be made from it.

It is named for the area in which it is found. Bruneau Canyon is located in southwestern Idaho, in the Owyhee County. Owyhee County is 102 miles wide from East to West, and this area is part of the great Columbia Plateau which extends into Nevada and Oregon. The elevation ranges from approximately 3000 feet to 5000 feet above sea level. In times past the area was the scene of the Miocene lake beds and Eocene volcanics.

Lavas are the predominant make-up of this area. Basalts are usually on the surface, underlain by rhyolite, latite, and andesite. Perlite, decomposed obsidian, is also interwoven among the different rhyolite formations. The canyon, itself, is

basically rhyolite in formation.

Hot springs, nearby, are the only active remnants of the volcanic age in Bruneau Canyon. The Bruneau river flows through what was probably, at one time, a huge fissure in the earth. The rhyolite cliffs, on either side of the river, may be as high as two thousand feet in places.

Bruneau Canyon Jasper is found in egg and vein formation in the rhyolite. Consequently, proper equipment, a good strong back, and plenty of hard work are necessary to free the jasper. Much of the work comes not only in the mining, but in packing this material from the "diggings." A 4-wheel drive vehicle is a must to master the canyon safely.

The colors and patterns of this fine material vary from a chocolate brown to a beautiful lighter brown with cream-colored moons, or "egg-pattern" as it is more generally known; a reddish brown and green with the light green moons, and some black jasper with red moons has been found but in lesser quantities. The

*(Concluded on page 70)*



Zephyr Banding of Bruneau Canyon Jasper

# Fossils in Indiana\*

By DR. T. G. PERRY

OBJECTS known as fossils have aroused the interest and stimulated the imagination of observant men for 2500 years, but a true understanding of the nature of these objects did not become prevalent until the beginning of the seventeenth century. Fossils are the remains of animals and plants which lived in the geological past and are now found naturally preserved in certain rocks (sandstones, shales and limestones) composing the earth's crust.

Many fossils enable us to clearly visualize animals belonging to races that have been extinct for scores of millions of years. A museum visitor, awed with the spectacular size and bizarre appearance of a dinosaur skeleton, is gazing upon a reptilian tyrant whose wrath, and that of its race, has slumbered in death for at least 60,000,000 years. If one wanders further among the museum cabinets containing relics of ancient life, he will most certainly pause before remains of invertebrate creatures which are somewhat reminiscent of modern crustaceans, such as the lobster and crayfish. The visitor's attention is now focused on a group of marine animals known as the Trilobites. One would search modern seafloors in vain for trilobites, as this spectacular race made its exit from the stage of life 200,000,000 years ago. Fossils are monuments of the dead, not only of individuals but of formerly flourishing races.

One naturally inquires, "How are the remains of animals which lived hundreds of millions of years ago preserved?" Most creatures which have left a record in rocks possessed hard parts of some kind, as bones, teeth, shells, or a chitinous external armor; such parts naturally lend themselves to preservation. Imagine a snail that died in the ocean several million years ago. The soft tissues of its body, although largely inclosed by a sturdy

shell, soon disappeared due to the ravages of bacterial activity or marine scavengers. The shell, however, remains intact. In a comparatively short time, geologically speaking, the shell was shrouded in sand or mud that was carried into the sea by rivers, and the shell was well on its way to becoming a fossil. With the passing of years—and the paleontologist commonly thinks in terms of millions of years—the inclosing cloak of sand and mud increased in thickness, and slowly the originally incoherent shroud was transformed by geological processes into rock. The shell was securely entombed, and awaited the hammer of the inquisitive paleontologist.

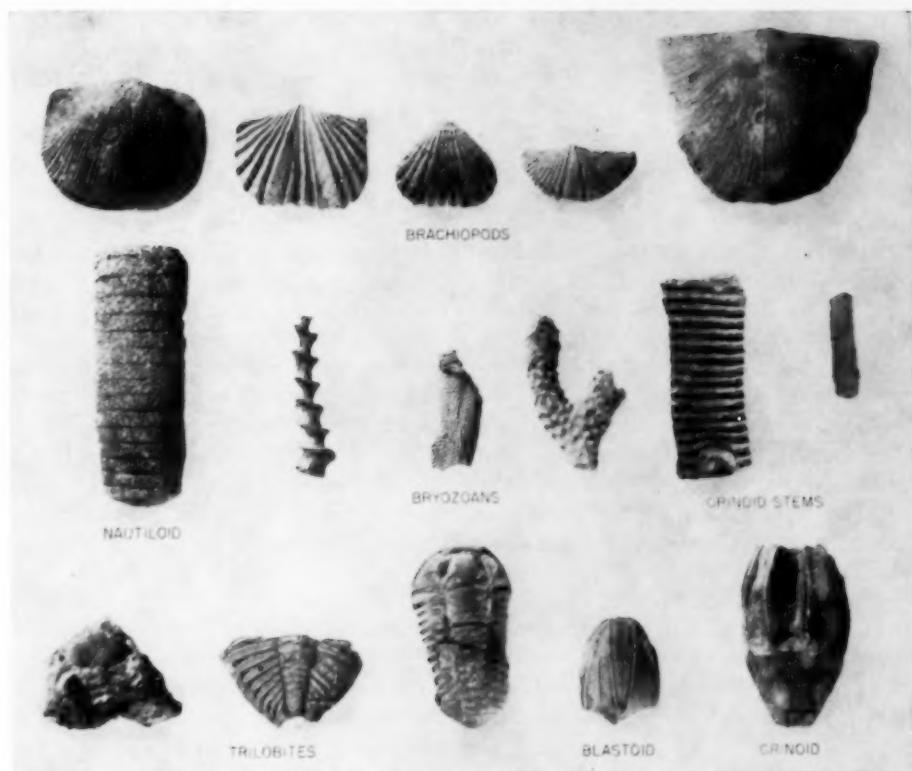
A discussion concerning the usefulness of fossils would be too lengthy to include here. Suffice it to mention that fossils are daily employed by geologists in their search for petroleum, by biologists in their studies of organic evolution, and by climatologists in their endeavors to obtain an insight into ancient climates. How strange that lowly invertebrates living millions of years ago are now playing a significant role in the quest for one of our most vital natural resources, petroleum.

Now that the reader is acquainted with the nature of fossils, how organic remains are commonly preserved, and their usefulness, let us consider some of the fossils most frequently found in Indiana.

Even a brief visit to most rock exposures (out crops in geologic lingo) will reveal brachiopods (see plate). Brachiopods are marine invertebrates which still live in our present seas, but which flourished in much greater numbers from 250,000,000 to 400,000,000 years ago. As a matter of fact, the paleontologist first encounters brachiopods in rocks that were being formed 525,000,000 years ago, an antiquity beyond comprehension.

\*Published by permission: *Outdoor Indiana*. Vol. XIX, No. 5.





The specimens shown above are approximately  $\frac{2}{3}$  actual size, with the exceptions of the nautiloid, the crinoid and the trilobite head which are  $\frac{1}{3}$  actual size. Photos by George Ringer.

Brachiopods remind one somewhat of modern clams, inasmuch as their soft bodies are housed between two shells composed of calcium carbonate. One will notice instantly that the shells vary considerably in size, shape, and in their surface features. Some shells are characterized by alternating, closely spaced ridges and grooves, while others are almost smooth. In life, most brachiopods were anchored to the seafloor by a fleshy stalk which emerged from between the shells or from a small opening centrally located along the upper margin of one of the shells. Brachiopods are complex animals, having well developed blood vessels, muscles, reproductive organs, etc. The muscles open the shells so that the animal may feed and close them for protection. Paleontologists probably rate the brachiopods as the most useful group of fossils because they are commonly found

in large numbers and well preserved.

Bryozoans are tiny, colonial animals, which have thrived in the oceans for 450,000,000 years. A great variety of shapes are assumed by bryozoan colonies, many resembling stony twigs while others look like a piece of lace. Probably the most spectacular fossil bryozoans are screw-like forms. A close examination of brachiopods will commonly reveal bryozoans firmly attached to their shells. A careful scrutiny will reveal that bryozoans appear strikingly porous, particularly so if examined with a lens. In life, a living animal occupied each tube-like pore. The paleontologist distinguishes bryozoans from one another by observing all the characters of the pores, such as their size, shape, and the structures contained within them. Such study must be done with a microscope, and the bryozoan colonies must be cut into thin sections.

Proud will be the collector whose efforts are rewarded with the finding of a well preserved representative of any of the diverse creatures included within the phylum Echinodermata, literally the spiny skinned animals. Perfect specimens of these marine invertebrates surely are the startling highlights of any paleontological collection. Living echinoderms include animals popularly known as sea cucumbers, sea lilies, sea urchins, and starfish; blastoids (sea buds) and cystoids (sea bladders) are the principal extinct members of the phylum.

Animals, strikingly different in body form, are included within the phylum Echinodermata, but certain characteristics are shared by all. First, all echinoderms fashion an outer protective skeleton composed of many polygonal, closely adjoining, calcareous plates. Second, the echinoderms are unique among the invertebrates in having a system of canals or vessels through which water circulates. Third, many echinoderms display a distinct pentamerous radial symmetry. Some echinoderms, as the starfish, feed directly through the mouth, while others, as the sea lilies (crinoids), sweep their food to the mouth by means of highly branched, grooved arms. Some echinoderms can move, walking or crawling in a sluggish manner; others, as the blastoids, cystoids, and most crinoids, are attached throughout their life by a long column or stem that consists of numerous, superimposed, disc-like plates. Many formations in Indiana are rich in the remains of such columnal plates, but one must be fortified with patience to attain the treasured prize, a nearly complete skeleton.

The trilobites, ancient relatives of the lobster and crayfish, were mud grovellers and scavengers, and probably appeal to more people than any of the other invertebrate fossils. The name trilobite alludes to the fact that the animal was divided into three lobes longitudinally: a central, somewhat arched axis or axial lobe and on each side a lateral lobe. Trilobites are extinct, although 500,000,000 years ago

these ancient crustaceans were the most powerful and complex animals alive, an ephemeral honor presently claimed by man.

Trilobites had their soft parts protected by an external skeleton that covered the upper surface of the body. Chitin constitutes most of the hard, outer coat of insects and crayfish. The lower surface of the body was covered merely by a membrane affording little protection to its owner. The transverse divisions of the body are well marked, and, from front to rear, are known as the cephalon (head), thorax (body), and pygidium (tail).

Most trilobite remains reveal only the features associated with the dorsal (upper) surface. Since the trilobites are structurally complex animals, a formidable number of terms is used to designate their many structures; let us refrain from becoming baffled by terminology. The most significant structures exhibited by the trilobite are undoubtedly those associated with the head such as the compound eyes, which often appear as slightly elevated, crescentic ridges. In many trilobites the number of facets composing the eye can actually be counted, a most amazing circumstance in light of the race's antiquity. Large spines projected back from the sides of the head in some species, and in extreme instances extended to the rear edge of the tail. The mouth was located on the lower side of the head. A pair of delicate antennules projected in front of the mouth, but these structures are rarely preserved. The thorax, or body, is distinctly segmented, the number of segments ranging from two to 44. Because the flange-like front part of each segment passes beneath the rear margin of the adjoining segment, they were movable upon one another, so that in some of the coiled trilobites the tail lies almost immediately below the head. The tail is a solid plate relatively devoid of structure, although prominent spines may be found on the periphery of some. The lower side of the body bore jointed, limb-like appendages in life, although these structures are

rarely preserved. Walking and swimming were principally accomplished by the body appendages; those located behind the mouth being highly modified for chewing.

Trilobites ranged in length from a quarter of an inch to 29 inches, but most were about two inches. Full stature was obtained through a series of molts, in which the trilobite cast off its protective armor to allow the addition of new body segments, a molt being required for the addition of each segment.

Trilobites were undoubtedly the dominant form of life when the oldest abundantly fossiliferous rocks were being formed. One may well inquire as to the factors that brought about their decline and ultimate extinction. With the passage of geological time, new groups of animals evolved, such as the giant nautiloids and primitive fish, which probably competed with the trilobites for the food available or for living space on or above the sea floor. The paleontologist has noted that the appearance in the rocks of fossils of other kinds of animals coincided with the decline of the trilobites, which could not maintain their former supremacy in competition with those more highly advanced animals.

The last group of fossils of interest to most Hoosiers is the nautiloid, the pearly nautilus being a living example. For nearly 200,000,000 years, nautiloids were the largest of all invertebrates, as certain members of the race attained the length of more than 12 feet. The nautiloids, however, have dwindled to insignificance until the race is now but a shriveled remnant of its former grandeur.

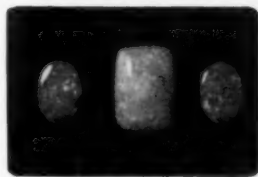
The nautiloid shell may be likened to a straight, tapering cone divided internally into a number of chambers by transverse partitions known as septa. The soft body occupied the last formed chamber of the shell between its opening and the last formed septum. A thin, hollow tube extends practically the entire length of the shell. The position and shape of the tube are of great value in classifying

the nautiloids and in tracing the many lineages represented by the genera and species of the race. Although often straight, the nautiloid shell may be curved in varying degrees, and some are tightly coiled, giving the appearance of a rolled garden hose.

Although fossils of the races discussed here are common in the rocks of Indiana, many other fossils can be collected. Ancestors of existing corals, snails and clams are abundantly found in our rocks. In addition, Indiana's rocks are noted for their remains of stromatoporoids, an extinct group of marine invertebrates whose biological relationships are not certainly known. Also, single-celled, minute invertebrates (protozoans) occur abundantly in the renowned Indiana building stone. Traces of plants and ancient fish are also entombed in the rocks of this state.

The great majority of the fossils in Indiana are representatives of marine races, and mutely testify that the sea has invaded our state repeatedly in the geological past. The study of these fossils reveals that many prehistoric races have humble beginnings, rise to the climax of their racial careers and then decline to extinction, a trend reminiscent of the words of Shakespeare:

"Life's but a walking shadow, a poor  
player  
That struts and frets his hour upon the  
stage  
And then is heard no more." (MacBeth.)



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(Continued from page 55)

**INDIANA GEOLOGY AND GEM SOCIETY** has completed a permanent exhibit showing the geological history of Indiana and its commercially valuable mineral resources. The display is housed in five separate cases that are fitted together on a circular, revolving base. Maps related to the display form the backgrounds of the cases. The cases contain the following individual exhibits: 1. Life in Ancient Seas, illustrated with fossils from all the exposed rock stratum in Indiana. 2. Gifts of the Glaciers, contains specimens of sand, gravel, marl and peat. 3. From the floors of Vanished Oceans, features construction materials such as limestone, sandstone, shale, clay and gypsum. 4. Fuel materials that were once living, coal, oil, etc. 5. Anybody Can Collect, contains rocks and minerals found in Indiana's road cuts, gravel pits, stream beds, caves, and dunes.

**MICHIGAN GEM AND MINERAL SOCIETY** is starting its third eight-week course on lapidary. The class is given by Russ Wilkinson and is being repeated for the third time because it has received such enthusiastic response from the club members.

**OZARK MOUNTAIN GEM AND MINERAL SOCIETY** recently enjoyed a covered dish dinner followed by an auction of slabs purchased by the society, and minerals, gems, and jewelry donated by its members.

**CHICAGO ROCKS AND MINERAL SOCIETY** on January 10 was addressed by Albert Forsley, Associate Curator of Mineralogy and Petrology at the Chicago Natural History Museum. Concretions, geodes, and other mineral segregations were discussed by Mr. Forsley and he used representative specimens from the museum to illustrate his talk.

**WISCONSIN GEOLOGICAL SOCIETY** on Jan. 12 viewed a very interesting color and sound film, produced by the Calumet and Hecla Mining company, on copper mining in Michigan's Keeweenaw Peninsula. Dr. Katherine Nelson completed the program with an educational talk on the "Cryptocrystalline Varieties of the Quartz Family."

**MADISON GEOLOGICAL SOCIETY** on Feb. 2 heard John C. Rose, instructor in geology at the University of Wisconsin, speak on "Geodesy." This science deals with the shape of the earth and its precise dimensions, which is of grave concern today with regards to intercontinental ballistic missiles. During the IGY year Mr. Rose installed gravity stations in the Antarctic, Australia, New Zealand, and in a line from Alaska to Mexico.

**CENTRAL IOWA MINERAL SOCIETY** learned to cut hearts at its January lapidary meeting. Emmet DeVries demonstrated the proper angle for achieving the very fine "V" that he obtains in cutting hearts. Don Sanders gave the group a talk on "Amethyst," its history, characteristics, where found and how it is polished in Mexico.

**MINNESOTA MINERAL CLUB** plans to maintain a fossil or mineral exhibit in the Science Museum of the St. Paul Institute. This will enable the museum to display material of a quality not available to it at this time. The first display will be select specimens from Hazen Perry's wonderful collection.

**NEBRASKA MINERAL AND GEM CLUB'S** Jan. 21 meeting was devoted to mineralogy. Across the front of the hall was a chart illustrating the Dana system of indexing minerals. Beneath the chart were mineral specimens that were properly identified and numbered in accordance with the system. A quiz on mineralogy was given after Mrs. Bertha Minardi showed sixty colored slides in the order of the Dana system.

\* \* \* \*

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(Continued from page 62)

While the authors themselves specialize in invertebrates and algae, they have drawn upon the researches of many well known specialists in other fields. The restoration drawings by the Fentons and those of vertebrates by other scientists are especially helpful for the amateur. The diagrammatic sketches are excellent, for example, that of a rugose or horn coral, showing clearly all those troublesome names such as dissepiments, septa, tabulae, etc. There are many hundreds of clear drawings and photographs, some of the latter in beautiful color. Much new material will be found in this book.

The Fentons' experiences in geology, paleontology, and biology plus their writing abilities make this a book to delight and instruct all those with a curiosity about past life on this planet. It should be in the libraries of all fossil collectors who are not ready for college texts in paleontology and paleobotany.

S.A.B.

\* \* \* \*

"OHIO FOSSILS": Hundreds of Midwest Rockhounds no doubt will be journeying to Ohio in June to attend the big 19th Annual Convention of the Federation being held in Springfield with the Miami Valley Club as their hosts. Many of the visitors also will attend field trips programmed by the snow, and others will collect on their own both going and returning to their homes.

To make these collecting expeditions more profitable we recommend that anyone planning such a trip provide themselves in advance with a copy of the book "OHIO FOSSILS", recently published by the Ohio State Geological Survey in answer to a long-standing demand by professional geologists, amateur collectors and the public generally, for a book on Ohio Fossils.

This book was prepared to serve as an introduction to the paleontology of Ohio and is designed for those who have never studied the subject before. The first three chapters serve as a background to the study of fossils. The first deals with the nature of fossils, methods of collection, preparation, and study, and explains the basic concepts of the Linnaean system. The second chapter places fossils in their relationship to time and constitutes a short, non-technical geologic history of the state. The third chapter outlines the classification of plants and animals, with particular stress on those groups which are represented in Ohio's rocks.

The seven main chapters (4-10) of the book describe in non-technical language the commoner fossils found in each geological system in the state. Line drawings, 413 of them, illustrate the main features of the most abundant forms. Both old and new names for a given

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*(Continued from page 69)*

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*(Continued from page 63)*

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1. Any boy or girl, 16 years of age or under as of June 30, 1959, is eligible to compete.
2. Each essay shall be entirely the work of the person entering the same.
3. The subject of the essay shall be: "The Advantages of Being a Rockhound," and shall be not more than 1,000 words.
4. Prizes will be awarded at the 1959 Convention of the American Federation at Portland, Oregon, held September 5 through September 7, 1959. The prizes to be awarded are as follows:  
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6. All entries are to be addressed:  
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1020 Russ Building  
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### ADVERTISERS' INDEX

Albanese, John S.	79
Alaska Lapidary Service	69
American & N.W. Federations	71
American Geological Institute	70
Am. Gem & Min. Suppliers Assn.	73
Bergsten, L. J.	74
Everett Lapidary Shop	72
Gem Cutters Guild of America	50
Gems and Minerals	78
Geode Industries	74
Kaye, C. R. & Sons	72
Kyte, Ken	71
Lapidary Equipment Co.	73
Lost Cabin Trading Post	72
Midwest Federation Emblems	68
Midwest Federation	80
Mineral Science Institute	72
Minerals Co., The	69
Minerals Unlimited	70
Office Specialties	69, 72, 79
Ottawa Valley Gem Shop	79
Paradise Gems	71
Prospector's Shop, The	73
Riley Rock Shop	73
Roberts, Tom, Rock Shop	79
Rockhound Bus Museum	73
Rocks & Minerals	70
Stewart's Gem Shop	78
Vellor Company, The	79
Victor Agate Shop	50
Ward's Natural Science Estab.	78
Western Rock & Gem	69
White Mountain Mineral Shop	79
Wiley & Sons, Inc.	56
Willems, Dr. J. Daniel	67
Williams, Scott	72

(Classified ads, see pp. 75-77)



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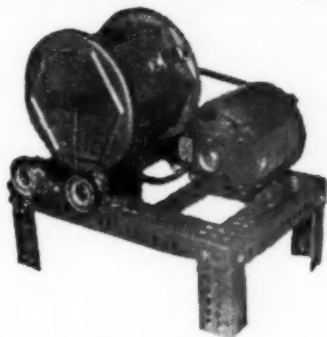
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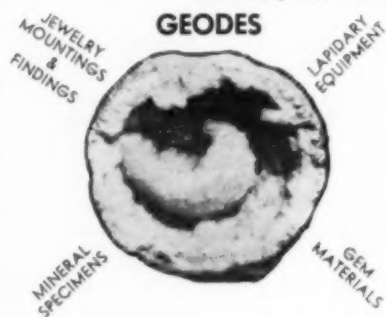
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